



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,643	07/01/2004	Martin McVicar	KEL01 P-136	2869

7590 09/19/2005

Timothy A Flory  
Van Dyke Gardner Kinn & Burkhart  
2851 Charlevoix Drive SE  
Post Office Box 888695  
Grand Rapids, MI 49588-8695

EXAMINER

COOLMAN, VAUGHN

ART UNIT PAPER NUMBER

3618

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/500,643

Applicant(s)

MCVICAR ET AL.

Examiner

Vaughn T. Coolman

Art Unit

3618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/23/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In re claim 5, the subject matter is best understood as the two identical front wheels with identical hydrostatic motors both trying to drive the forklift forwards along a line of travel normal to each respective wheel's axle. Said lines of travel intersect at a point forward of the forklift truck body perimeter. Would the third or rear wheel being driven by a hydrostatic motor cause the truck to rotate, not about the common vertical axis, C, as claimed, but about a vertical axis passing through the point of intersection of the front wheels' lines of travel? Along a similar line of reasoning, would the two wheels overpowering the third cause skidding and slipping of the third wheel, regardless of the direction of rotation in carousel mode? If so, would said skidding and slipping also tend to cause the forklift truck to rotate about an undetermined and constantly changing vertical axis of rotation, rather than the common vertical axis, C, as claimed? Also, if the claimed invention works as recited in the specification, is it an intended effect to wear down the "other front wheel" at a substantially faster rate than the one front wheel coupled to the switchover valve?

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (U.S. Patent No. 3,998,288) in view of Skaalen et al (U.S. Patent No. 4,599,030).

In re claim 1, Aoki shows a four-directional forklift truck (FIG 6) comprising a chassis (FIG 2, item L) having two front wheels (items B, C) and one rear wheel (items A), each wheel being directionally adjustable (FIGS 3, 4) by rotation about a substantially vertical axis (items P, Q, R). The forklift truck of Aoki is operable in three modes: conventional or standard, forward and reverse with rear wheel steering (FIG 1); sideways, translation right or left (FIG 4); and carousel mode, wherein the three wheels are set at respective directions in which their axes of rotation intersect at a substantially common vertical axis (FIG 3, item O) equidistant from each wheel whereby the truck rotates substantially about the common vertical axis. However, Aoki does not show the elements of either a respective motor for driving each of the three wheels selectively in either one of two opposite directions of rotation, or all three wheels being driven in the carousel mode. Skaalen teaches the use of a hydrostatic motor corresponding to each wheel in order to drive each wheel (Column 2, lines 46-49) selectively in either one of two opposite directions of rotation (FIG 8). Skaalen also discloses the practice of all wheels being driven in the carousel mode (FIG 8-J). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the forklift truck shown by Aoki with a hydrostatic

Art Unit: 3618

motor driving each wheel as taught by Skaalen, since such a modification would provide the of forward and reverse travel in conjunction with better traction control and handling for the forklift truck.

In re claim 2, Aoki in view of Skaalen discloses all of the elements of the claimed invention as described above, and Aoki further discloses that each wheel motor is of the hydrostatic type (Column 1, lines 58-60; Column 2, lines 3-4), and further discloses a hydraulic circuit comprising an oil tank and oil pump for supplying hydraulic fluid under pressure to each motor (Column 2, lines 9-12).

In re claim 3, Aoki in view of Skaalen discloses all of the elements of the claimed invention as described above, and further, the disclosure of Skaalen's hydrostatic motor, a Hagglunds wheel hub radial piston type motor, teaches that each motor has first and second hydraulic fluid inlet ports in the motor cylinder case (Column 4, lines 24-29). Skaalen also teaches that the motors are independent, and as noted above, able to rotate the wheels in two opposite directions. Using the Skaalen motor, it is obvious that the application of hydraulic fluid under pressure to the first inlet port drives the wheel in one direction and the application of hydraulic fluid under pressure to the second inlet port drives the wheel in the opposite direction. Also, the hydraulic circuit of Skaalen shows a source of hydraulic fluid under pressure (FIG 11, item 61). To power the four hydrostatic motors of the Skaalen invention, the source of pressurized hydraulic fluid must have at least first and second fluid supply ports, the hydraulic fluid under pressure being selectively supplied at the first or second supply port in order to drive the motors independently as stated above.

Art Unit: 3618

In re claims 4 and 8, Aoki in view of Skaalen discloses all of the elements of the claimed invention as described above, and furthermore, the forklift truck of Aoki modified as taught by Skaalen is obviously capable of operating in standard mode wherein the front wheels are set substantially in the front-to-rear direction of the chassis, and the rear wheel is steerable to turn the truck in the required direction, as shown (FIG 1) and described (Column 2, lines 23-31) by Aoki, with each hydrostatic motor driving each wheel in the same direction of rotation. As stated above, Skaalen teaches the independence of each motor, and therefore could reverse the flow, either at the source, or at the distributor valve (FIG 7, item 87) to one of the front wheels of Aoki (FIG 4, item B), and is therefore capable of operating in the sideways mode wherein the rear wheel is set substantially normal to the front-to-rear direction of the chassis, and the front wheels are steerable simultaneously in opposite directions of rotation, as shown by Aoki in FIG 4. Finally, when the forklift truck of Aoki as modified by Skaalen is operated in the carousel mode described above, all wheels are capable of rotating in the normal or standard direction, as described above relating to standard mode. In regards to the actuation of the switchover valve in the various modes, as stated above, Skaalen performs the identical function of reversing the fluid flow to an individual motor in substantially the same way, by operator controls, with identical results of rotating in individual wheels in either identical or opposite directions.

In re claim 5, Aoki in view of Skaalen discloses all of the elements of the claimed invention as described above, and furthermore, the forklift truck of Aoki modified as taught by Skaalen is inherently capable of operating in the carousel mode, as stated in re claim 4, wherein the rear wheel and the said one front wheel drive the truck about the common vertical axis, as best understood by the examiner, in a given direction of rotation against the action of the other

Art Unit: 3618

front wheel tending to drive the truck in the other direction of rotation. However, Aoki in view of Skaalen does not disclose a forklift truck wherein the first and second inlet ports of only one front wheel are coupled to the first and second supply ports of a hydraulic source via a switchover valve. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the forklift truck shown by Aoki in view of Skaalen with the limitation of only one switchover valve, or means for reversing flow in one hydrostatic motor independent of the other two, since such a modification would provide cost savings. If the means for reversing rotation of each wheel independently by reversing hydraulic fluid flow is a switchover valve, then one valve is less expensive than three. Also, If the means for reversing rotation of each wheel independently by reversing hydraulic fluid flow is a reversible hydraulic pump, or source of hydraulic fluid under pressure, for each motor; then one pump to drive two wheels and one to drive the third results in advantageous weight savings over one pump for each of three independent hydrostatic motors.

In re claim 6, Aoki in view of Skaalen, discloses all of the elements of the claimed invention as described above. In addition, for the reasons stated above in re claim 1, the forklift truck of Aoki modified as taught by Skaalen is inherently capable of operating in the carousel mode, whereby in the carousel mode all three wheels drive the truck about the common vertical axis in a given direction of rotation.

In re claims 7, 9, 10 Aoki in view of Skaalen, discloses all of the elements of the claimed invention as described above. Additionally, Skaalen teaches an electrical controller that allows the driver to select modes of steering via a display at the operator's console (Column 6, lines 18-20). Therefore, the forklift truck of Aoki modified as taught by Skaalen is obviously capable of

Art Unit: 3618

entering the carousel mode from sideways mode by reversing hydraulic flow to one of the front wheels, or de-actuating the switchover valve, when the front wheels are steered through a sufficient angle to set the three wheels at respective directions in which their axes of rotation intersect at the said substantially common vertical axis. In the controller taught by Skaalen, a microprocessor will command the steering of wheels from sideways to carousel mode when the operator desires to do so. It would have been obvious to one having ordinary skill in the art at the time the invention was made to automate the transition between the steering modes shown by Aoki, with the electrical controller taught by Skaalen, since it has been held that broadly providing a mechanical or automatic means, the electrical controller; to replace manual activity, the steering wheel and levers of Aoki (FIGS 1, 2); which has accomplished the same result, transition between steering modes; involves only routine skill in the art.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sugata et al. (U.S. Patent Nos. 6,866,113; 6,913,102) and Thompson et al. (U.S. Patent No. 4,986,387) both show forklift trucks that embody various elements of the claimed invention.

Bizzini (U.S. Patent No. 4,768,332) shows a three-wheeled industrial vehicle that maneuvers in the same modes using hydrostatic power similar to the claimed invention.

Griesenbrock (U.S. Patent No. 4,318,450) discloses a drive arrangement for a forklift truck analogous to that of the claimed invention.



Stimson (U.S. Patent No. 5,570,754) discloses a hydraulic steering and driving arrangement for a vehicle comprising a switchover valve for one of the front wheels used for modal driving.

Ron (U.S. Patent No. 4,823,899) discloses a steering arrangement and hydraulic drive for a vehicle similar to that of the claimed invention.

Chino et al. (U.S. Patent No. 6,293,022) discloses a mounting structure for wheel angle detector that is not mounted on the wheel.

Gilliem (U.S. Patent No. 5,181,579) and Hori et al. (U.S. Patent No. 6,460,639) both disclose a hydraulic steering and driving arrangement for a vehicle comprising a switchover valve for each of two drive wheels.

Buschbom et al. (U.S. Patent No. 4,373,600) discloses a hydraulic steering and driving arrangement for a vehicle analogous to that of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Travis Coolman whose telephone number is (571) 272-6014. The examiner can normally be reached on Monday thru Friday, 8am-6pm EST.

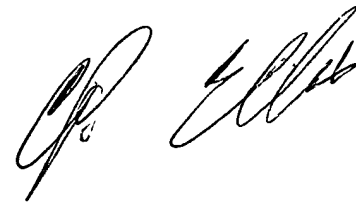
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Ellis can be reached on (571) 272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3618

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Travis Coolman  
Examiner  
Art unit 3618

vtc

Two handwritten signatures are present. The signature on the left is 'CP' with a stylized flourish. The signature on the right is 'T Coolman' with a stylized flourish.

CHRISTOPHER P. ELLIS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600